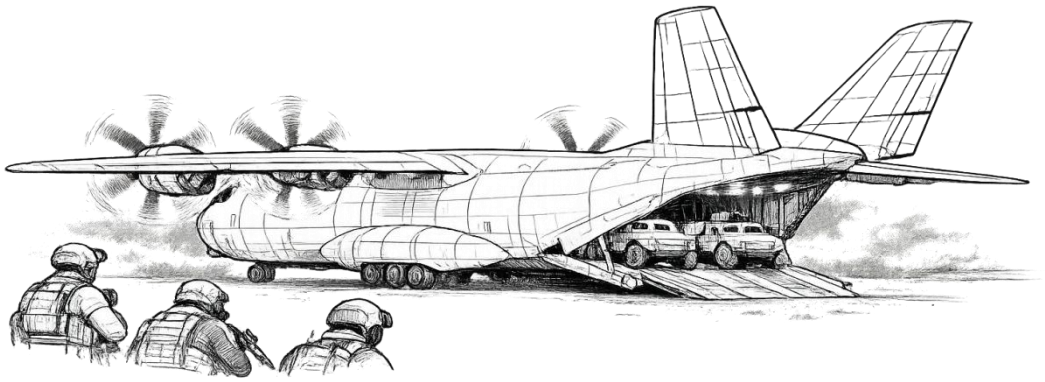
Transport Aircraft (Prototype) SST T-130 Argo (ST-02) "Bizon"



Entry

SST T-130 Bizon (ST-02) Preliminary Specifications:
Drive : 4x Europrop TP400-D6 (44,000 HP).
Propellers : 8-blade, composite, 5.3 m diameter (Ratier-Figeac).
Lifting capacity : 30,000 kg (e.g. 3 Argo vehicles or 1 heavy transporter).
Width Cargo space : 4.1 m.
Length Hold : 12-14 m (elongated compared to Sabretooth).

General Construction (Engineering Architecture)

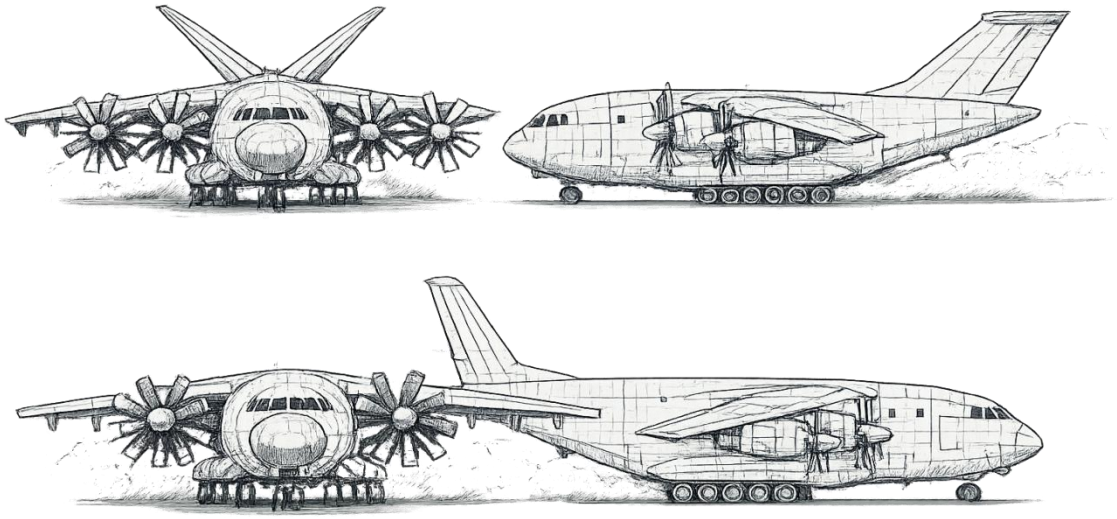
The engineering architecture of the SST T-130 Bizon (ST-02) represents a leap from "light predator" to "armored fortress." With a 30-ton payload capacity and four TP400 engines, the design must cope with forces that would destroy smaller vehicles.

Here is the detailed construction layout of the Bison:

1. Hull: "Double-Layered Battleship"
Hybrid Structure: The hull has a rectangular cross-section with rounded corners (maximizing cargo space). The frame is a dense network of 2195 Aluminum-Lithium frames.
Bizon-Core Capsule: The nose of the aircraft (cockpit and control systems) is an autonomous capsule made of Grade 23 Titanium. It is 40% larger than the Sabertooth, accommodating a crew of three and a defense systems operator station.
Lower Armor Belt: The bottom of the hull is lined with interchangeable Dyneema panels integrated

with titanium sheeting. This protects the 30-ton payload from fire from weapons up to 14.5 mm caliber.

2. Support System: "Wing-Bridge"
Architecture: High-wing monoplane with negative leading edge sweep at the root, which improves stability at low speeds.
"Double-Spar" System: Instead of a single spar, the Bizon has two titanium main spars (Grade 5) connected by crossbeams, creating a rigid "torque box." Four engine nacelles are mounted to this box.
Fuel as a Structure: The wings are "wet" (Integral Fuel Tanks), but divided into 12 compartments. The internal compartments serve as ballast to stabilize the aircraft when unloading 30 tons.



3. Tail: "V-Tail Heavy"
Geometry: We retain the butterfly layout (V-tail) with a wingspan increased to 16 meters.
Materials: The entire tailplane is made of high-modulus carbon composite (CFRP) with titanium edge fittings.
Advantage: With four engines, a traditional vertical stabilizer would experience lethal vibrations. The V-tail system "escapes" the main flow of turbulence from the four propellers.

4. Chassis: "Active Stiff-Extender 30T"
Layout: Three-support, hidden in sponsons.
Main Shaving: Two powerful carts, each with 6 wheels (3 pairs). Made of 300M steel and titanium.
"Walking" System: Each pair of wheels has an independent hydraulic actuator. The Bizon can "lift a leg" over an obstacle (e.g., a tree trunk) when taxiing in a swamp.
Kneeling: Hydraulics allow the entire hull to be lowered so that the ramp of the "Angelika 2" creates an almost flat transition with the ground.

5. System Architecture: "Full-Fiber"
Control: Quadruplex Fly-By-Wire based solely on fiber optics (MIL-STD-1773). Completely immune to electromagnetic pulse (EMP).
Power: Each of the four TP400 engines has a duplicate power generator. The Bizon can fly and

operate all its defense systems even with only one engine operational.

Scale Comparison

Element	T-110 Saber Tooth	T-130 Bison
Width hull	3.2 m	4.8 m
Girders wings	1 (Titan)	2 (Titanium Box)
Number	6	14 **wheels** (12 main + 2 front)
Armor	Integral Lower Shield	

Structural arrangement

The SST T-130 Bizon (ST-02) design evolved from a single-spar system to a power box (Power-Box). With a payload of 30 tons and four engines with a total output of 44,000 hp, the frame cannot be merely a "wing holder"—it must be an armored foundation capable of withstanding 4Gs upon landing on unpaved ground.

Here is a detailed description of Bison's engineering architecture:

1. Twin-Spar Titanium Box
Unlike the T-110, the Bizon has two parallel main spars passing through the hull.
Front and Rear Spars: Made of forged Grade 5 Titanium. They form a rigid frame (Wing Box) that transfers the enormous torque from the four propellers.
Ballast Function: The space between the spars inside the fuselage serves as the main fuel hub, which lowers the center of gravity (CoG) of the entire machine by 15% compared to the T-110.

2. Seismic Frames (Heavy-Duty Frames)
The Bison's hull is supported by so-called seismic frames, designed to dampen low-frequency vibrations.
Material: Hybrid of 7050-T7451 Aluminum and Maraging Steel inserts at the chassis mounting points.
Layout: Frames are spaced every 45 cm in the cargo hold area, creating a cage with high torsional stiffness. This prevents the hull from "floating" when the ramp is open and a 30-ton cargo is loaded.

3. Bizon-Pods sponsons
The side “bubbles” (sponsons) in which the landing gear is hidden have become an integral structural element.
Function: Not only do they house the 12 main wheels, but they also serve as the foundation for survival systems (flare launchers, MAWS sensors) and hydraulic cooling systems.
Aerodynamics: They are shaped to generate additional lift (lifting body) at low speeds, reducing the load on the wings.

4. Tri-Post Stabilization System
This is a critical element of the structural system at 30 tons.
Three tail struts: Instead of two, the Bizon extends three struts (one central under the ramp sill, two side ones).
Construction: 300M steel with titanium alloys. The system is integrated with the V-tail frame, preventing the rear fuselage section from flexing during unloading.

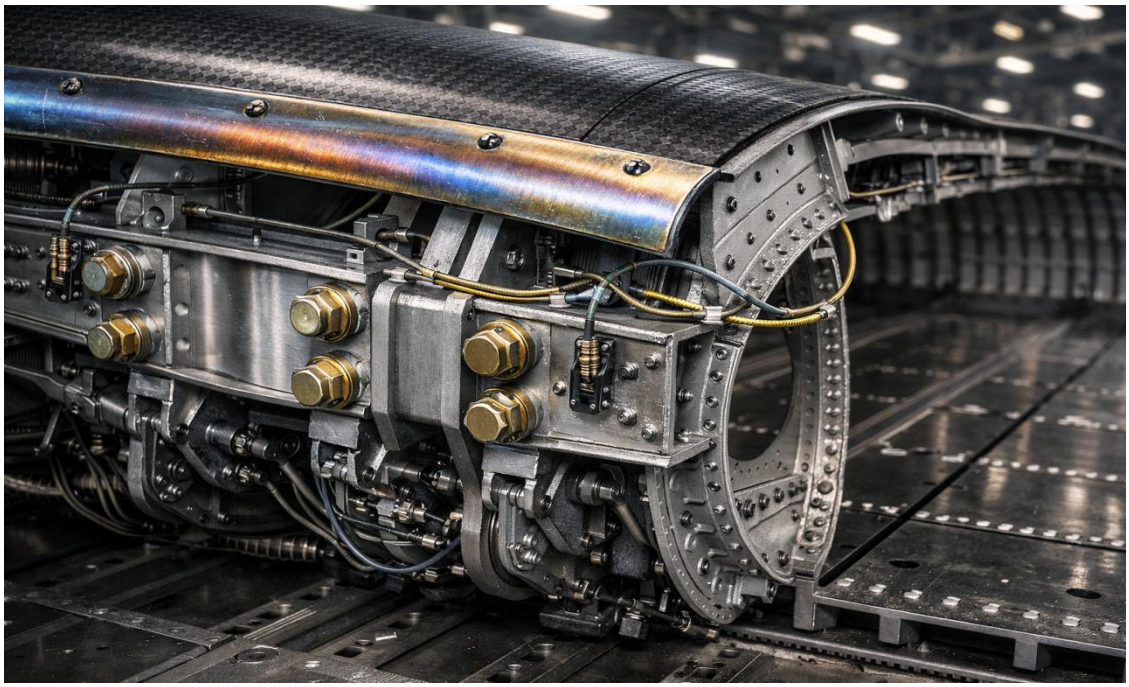
Material Table of the SST T-130 System:

Structure Element	Main Material	Why this one?

Main Girders Titanium Ti-6Al-4V Extreme strength with 4 engines.
Stringers Floors Vascomax 300 steel Does not crack under the pressure of 30-ton vehicles.
Cargo hold plating: Aluminum-Lithium 2195. 10% lighter than standard, corrosion-resistant.
Forged Steel Chassis Legs Highest Impact Resistance
(aircraft carrier standard).
Nose (Capsule) Titanium Grade 23 (ELI) Maximum ballistic resistance for the crew.

Material card for frame and sheathing

In the case of the SST T-130 Bizon (ST-02), the material specification is undergoing a drastic change. The move to a 30-ton payload and four TP400 engines means that the forces acting on the structure are three times greater than those of the "Sabretooth." We must use materials with the highest unit strength to prevent the aircraft from becoming too heavy to take off.



Here is the final material card for Bison:

1. The Titan-Steel Frame
Main Girders (Double Wing Box): Ti-6Al-4V (Grade 5) titanium, isothermally forged. Two girders form a "rigid box" supporting four engines and 30 tons of payload.
Main Frames: 7050-T7451 Aluminum Alloy. Selected for fatigue cracking resistance. Fix: Increased titanium riveting density in the center section by 15%.
Floor Stringers: Vascomax 350 Maraging Steel. An evolution from the 300 version – withstands track point pressure without deformation.

2. Bizon-Guard Capsule (Crew Protection)
Capsule Structure: Titanium Grade 23 (Ti-6Al-4V ELI). High ductility absorbs blast energy (mines/IEDs) under the nose.
Ballistic Shields: Boron Carbide (B4C) panels on bulkhead behind crew – protection against spalling from cargo hold.
Glass: Spinel (Ceramic) + Surlyn. Withstands a bird at 600 km/h and 12.7 mm fire.

3. Cover (Advanced Skin)
Lower Fuselage (Belly): Aluminum-Lit 2195. 12% stiffer than aluminum, prevents the fuselage from "warping" during STOL landing.
Upper Skin and Wings: High modulus CFRP (Carbon Fiber). Approximately 2 tons of weight reduction.
Leading Edges: Inconel 718. Nickel super alloy for erosion protection (sand/stones from 4 propellers).

4. Moving Elements (Actuators & Hinges)
"Angelika 2" Ramp Pins: Grade 5 Titanium + DLC (Diamond-Like Carbon). Dry running in dusty conditions without scuffing.
Ramp Locks: 300M Steel. Reinforced mechanical locks (response to hull pressure test).
Landing Gear: 300M Steel (AMS 6419). Withstands ground impact at a rate of 6 m/s.

Material comparison table:

Component	T-110 Sabre Tooth (10t)	T-130 Bison (30t)
Girder	Titanium G5	Double Girder Titanium G5
	Vascomax 300	Vascomax 350 (Ultra-High)
Floor		
Aluminum	7075 / Al-Li	Integral Al-Li 2195 + CFRP
	Titan G5	Titan G23 ELI
Capsule (Ballistic)		
Tail	CFRP with titanium power node	

Wings

In the SST T-130 Bizon (ST-02) project, the wings are no longer mere airfoils but become a massive energy platform. They must support four TP400 engines (approximately 8 tons of propulsion mass alone), fuel for 5,000 km, and withstand the enormous torsional forces generated by 32 propeller blades.

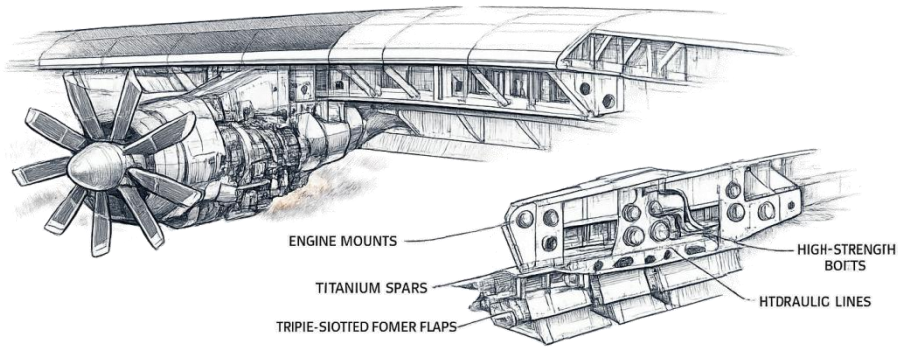
Here are the engineering specifications for the Bison wings:

1. Architecture: Torque Box
Structure: Twin-spar wing. Two parallel Grade 5 Titanium spars form a rigid tunnel that houses the main fuel tanks.
Geometry: High-wing monoplane with a slight sweptback (approx. 15°) and pronounced anhedral. This allows the four engines to hang low, facilitating ground access for maintenance and improving stability at low speeds.

2. STOL 2.0 Mechanization (High-Lift System)
For the 80-ton Bison to take off from a forest track, the wings must literally "pump" air:
Blown Flaps: Powerful, three-slotted CFRP Fowler flaps are positioned directly in the propeller slipstream of all four engines. Air from the propellers is "bent" downward, generating additional lift (super-thrust) even when the aircraft is barely moving.
Titanium Slats: Full-span movable leading edges reinforced with titanium to protect the structure from rocks and ice thrown up by the inner propellers.

3. Integration of Drive and Vibration
Heavy-Mount Pylons: Each of the four engines is mounted on an Inconel and titanium pylon. Active piezoelectric dampers are used to reduce vibration by 40% before it transfers to the fuselage.

Winglets: Instead of classic winglets, the Bizon has so-called Raked Wingtips, which reduce edge vortices, increasing strategic range by approximately 7%.



4. Technical Specifications of the Wings:
Span: 42 meters (16 m more than the T-110).
Supporting area: 180 square meters
Tank capacity: 45,000 liters (fuel as a mass balancing the bending moments).

Aerodynamic spoilers

In the SST T-130 Bizon (ST-02), with its four engines producing a combined 44,000 hp, spoilers serve as a critical safety system. With a 30-ton payload, conventional ailerons are unable to control the inertia of such a powerful machine, so the Bizon utilizes the Integrated Spoileron Matrix system .

Here are the engineering specifications for the Bison spoilers:

1. Construction: "Heavy-Duty Matrix"
Instead of long, uniform panels, the Bizon has 12 independent spoiler sections (6 for each wing).
Material: Titanium Honeycomb core covered with a high-temperature carbon composite (Bismaleimide - BMI) skin. These must withstand the powerful air pressure directly from the TP400's four propellers.
Actuators: Electro-hydraulic actuator (EHA) system operating at 5,000 psi. Each panel has its own independent actuator, ensuring redundancy – even if debris damages two panels, the rest continue to function.

2. Operating Modes (SST-Logic)
Roll Augmentation: With such a wide fuselage (4.8 m), the Bizon has enormous lateral inertia. The spoilers deflect asymmetrically, "killing" the lift on one wing, allowing for sharp evasive maneuvers in tight valleys.
Rapid Lift Dumping: After touchdown with 30 tons, all 12 panels are raised to a 70-degree angle. This immediately presses the 12-wheel chassis to the ground, allowing full use of the carbon brakes without the risk of skidding.

Asymmetric Thrust Counter (4-engine compensation): If one of the outer engines stalls, the FBW system automatically extends the spoilers on the opposite wing to counter the enormous 11,000 hp torque of the other outer engine.

3. Innovation: "Vortex-Serrated Edge"
The trailing edges of the spoilers on the Bizon are not straight – they have deep V-shaped serrations. The goal: To break up the powerful air vortices from the four propellers. This prevents buffeting (vibrations striking the V-tail), which, at 30 tons, could lead to fatigue fracture of the tail root.

Spoiler Comparison:

Parameter	**LST T-110 Sabre Tooth SST T-130 Bison**
Number panels	4 sections 12 sections (Matrix)
Material	CFRP / Titanium BMI Carbon / Titanium Honeycomb
Time reaction time	0.1 s 0.05 s (Ultra-Fast EHA)
Function Home	STOL / Braking Stabilization 4 motors / Lift Dumping

Structural Integrity Enhancement Plan

We are focusing on ensuring that the SST T-130 Bizon does not "split apart" under the influence of the enormous torque from the 4 engines and the 30-ton payload.

Here is the official Structural Integrity Enhancement Plan (SST-IP) for the ST-02 release:

1. Titanium Backbone Node (Wing-Fuselage Connector)
This is the most important point. With four engines, the wings tend to "break away" from the fuselage.
Reinforcement: We introduce four titanium yokes (Grade 5) that connect the double wing spar directly to the main fuselage power frames.
Technology: Cold-fit titanium screws (interference fit), which eliminates play and the risk of fatigue micro-cracks due to vibrations from the 32 propeller blades.

2. Stabilization of the Tail Section (V-Tail Root)
The test showed that the tail was in resonance.
Reinforcement: We introduce a longitudinal stiffening panel made of high modulus CFRP that runs from the center of the cargo bay to the root of the V-tail.
Mass Dampers: We install active mass ballasts at the ends of the stabilizers, which computer-controlledly reduce vibrations generated by the airflow from the four TP400 engines.

3. Shear Panels in the Cargo Bay
At 30 tons the hull tends to twist (corkscrew effect).
Reinforcement: We install so-called shear plates (Shear Ties) between the Al-Li 2195 frames.
Material: A hybrid of aluminum and titanium. They create a rigid tube that ensures the hull maintains its ideal cross-section even during rapid maneuvers with a heavy vehicle inside.

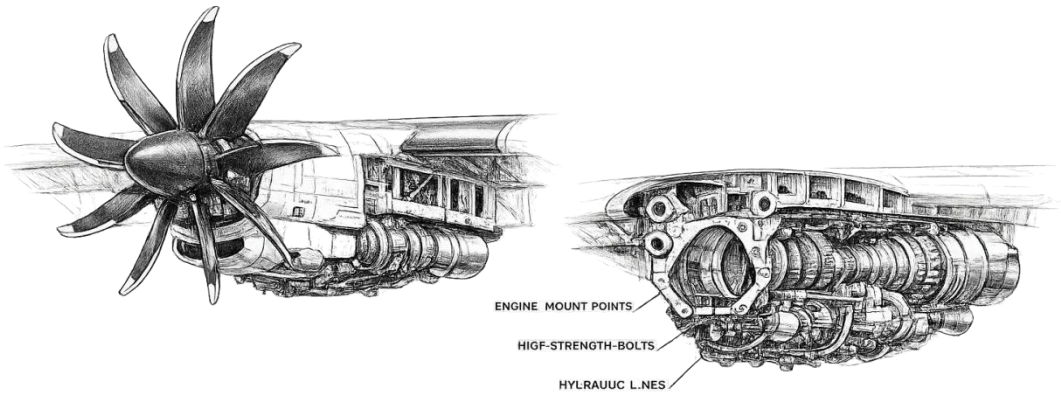
4. SHM (Structural Health Monitoring) System
The buffalo will "feel" its fatigue.
Sensor network: We incorporate a fiber optic network (Bragg Gratings) into the structure of the girders and frames.
Operation: The system reports in real time to the cockpit if lower abdominal stress exceeds 90% of normal. This allows the pilot to immediately correct the flight to avoid damaging the aircraft.

Strengthening Plan Summary:

Item	Solution	Purpose
Main node	Titanium yokes G5	Stabilization 44,000 HP power.
Tail	Composite stringer	Elimination of flutter (vibrations).
Sides Hull	Shear Plates (Shear Ties)	Torsional stiffness at 30 tons.
Belly	Al-Li 2195 + SHM	Protection against "swelling" of the structure.

Engine

We're focusing on the heart of the T-130 Bizon SST propulsion system. Switching to a quadruple TP400-D6 system isn't just about adding two engines—it's a complete revolution in how the aircraft manages power and aerodynamics .



Here are the drive specifications for the Bison:

1. Power parameters (Quad-Power)
Total power: 44,000 hp (4x 11,000 hp).
Unit thrust: These engines generate so much airflow that the Bizon can "hover" on its propellers at very low forward speeds, which is crucial for short-runway (STOL) landings.
Propellers: 8-blade, composite Ratier-Figeac, 5.3 m in diameter. Each pair of propellers on one wing rotates in opposite directions (Counter-Rotating), which reduces the turning moment and facilitates piloting with a 30-ton payload.

2. Pylons and Engine Mounts
With 4 engines, vibrations are the biggest enemy of the structure.
Material: Pylons made of Inconel 718 (temperature resistance) and titanium fittings.
"Soft-Mount" System: The engines are mounted on active dampers that computer-controlled adjust their stiffness to prevent vibrations from the propellers from being transferred to the titanium main spar.

3. Asymmetry Management (FADEC 2.0)

In the Bizon, the engines are connected by a digital data bus.
"SST-Sync" Mode: The FADEC system automatically synchronizes the blade phases of all 32 blades (4 engines x 8 blades). This results in a lower engine noise and less tiring for the crew in the titanium capsule.
Fail Safe: If the outer engine (No. 1) fails, the No. 4 (far right) engine immediately corrects the blade angle to prevent the pilot from losing control of the aircraft.

4. Reverse and Cooling
Braking: All four engines have full reverse. With a mass of 80 tons (aircraft + 30 tons of cargo), the reverse of the four TP400s allows the Bizon to stop in less than 600 meters.
Air intakes: Reinforced with titanium mesh to protect the turbines from being sucked up by stones kicked up by the front wheels on grass landings.

Drive comparison table:

Feature	**T-110 Sabre Tooth**	**SST T-130 Bison**
Number engines	2x TP400-D6	4x TP400-D6
Total power	22,000 HP	44,000 HP
Number shovels (total)	16	32
Wear fuel	Optimal (tactical)	Increased (strategic)
Role Propellers	Propulsion	Propulsion + Active Lift Generation

Tail Engineering Specification

In the SST T-130 Bizon (ST-02) design, the tail assembly must cope with the enormous air turbulence generated by the 32-blade propellers. A classic "T" arrangement or single vertical stabilizer would not work at this power level, so the Bizon utilizes a reinforced Heavy V-Tail arrangement.

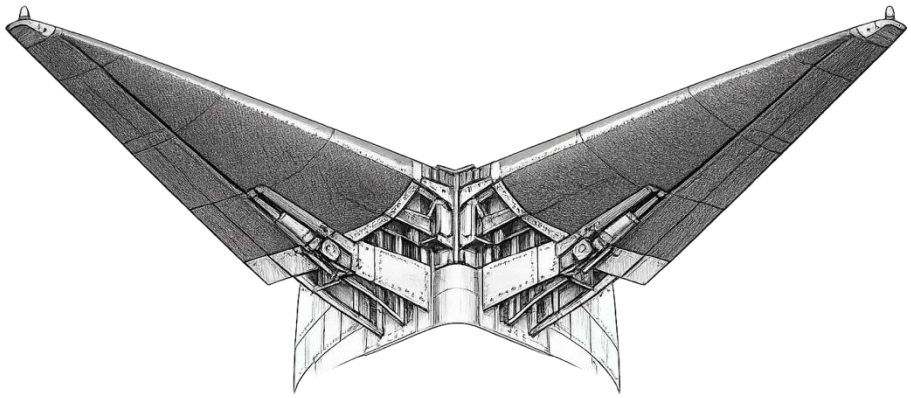
Here are the engineering specifications for the tail:

1. Geometry and Layout: "Butterfly SST"
Swing angle: 115 degrees. This arrangement places the stabilizers outside the main, most turbulent propeller flow of the inner engines.
Hybrid function: The rudders act as both elevator and rudder. With a payload of 30 tons, this allows for more precise pitching moment management during STOL takeoff.

2. Material Architecture: "V-Power Core"
The Root: The main point of contact between the tail and the fuselage is a massive Grade 5 Titanium casting. It must withstand the bending forces when the Bison takes a sharp evasive action at full load.
Tail spars: Constructed from high-modulus carbon fiber composite (CFRP) with integrated titanium ribs. This provides stiffness with minimal weight (reducing the pendulum effect on the tail).
Leading Edges: Inconel 718 lined to protect the tail from erosion caused by ice and rocks thrown up by the 4 TP400 engines.

3. Control and Stabilization Systems
Triplex EHA Actuators: Each control surface is driven by three independent electrohydraulic actuators. Even complete deactivation of one control surface allows for a safe landing thanks to the engine thrust redundancy.
Active Flutter Damper: FBW-controlled balancing masses are installed inside the stabilizers. They

absorb resonant vibrations generated by the 44,000 horsepower, preventing material fatigue at the fuselage junction.



4. Special Equipment
Tri-Post Node: At the bottom of the tailstock there is a socket for the central hydraulic support (third leg of the stabilization system) which takes a pressure of 30 tons during loading.
MAWS/LWR Sensors: Missile Warning System sensors are mounted on the tops of the stabilizers, giving the Bizon 360-degree visibility.

Tail Technical Table:
Parameter **Specification**
Type Heavy V-Tail
Construction Titanium base + Graphite-epoxy plates
V-span 16.5 meters
Inconel 718 **Leading Edge (High Erosion Resistance)**
Quadruplex Fly-By-Light **Control (Fiber Optic)**

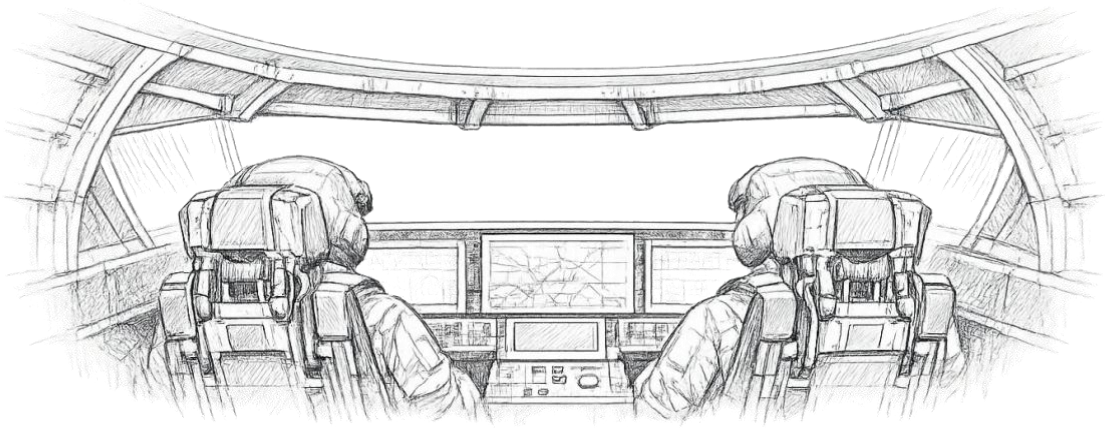
Cabin

In the SST T-130 Bizon, the cabin isn't just a workspace for the pilots; it houses an autonomous Titanium Survival Capsule (Bizon-Guard). With an SST-class machine operating in harsh conditions and carrying 30 tons of cargo, the crew must have maximum protection and digital support.

Here are the engineering specifications of the cabin:

1. Structure and Security
Monolithic Capsule: The entire nose section is constructed of die-cast Grade 23 Titanium (ELI). In the event of a crash landing, the capsule maintains its shape, protecting the crew from being crushed by the 30-ton payload sliding forward.
NBC Shielding: The cabin is completely isolated from the cargo hold by a pressure-resistant titanium bulkhead. It has its own filtering and ventilation system (protection against biological and chemical weapons).

Ejection Seats: 3x Martin-Baker Mk.18 class seats (optimized for zero altitude and zero speed – 0-



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2. Crew layout (3-person)
Pilot (Lefthand Seat): Mission commander, manages flight and STOL systems.
Co-Pilot (Righthand Seat): Responsible for the navigation and systems of the 4 TP400 engines.
Loadmaster / Defense Systems Operator (Central Station): Sits slightly deeper and higher. Viewing the cargo bay via cameras, he manages the DIRCM (Defense Against Missiles) system and balances the 30-ton cargo.

3. Glass Cockpit 2.0 interface
Widescreen Displays: Five 15-inch high-brightness, glove-friendly touchscreens.
HMD (Helmet Mounted Display): Pilots wear helmets integrated with an external camera system. This allows them to "see through the floor" during the Bison's precise landing on narrow forest tracks.
Spinel Glass: Transparent ceramic with armor strength, with an electrically heated layer to prevent icing.

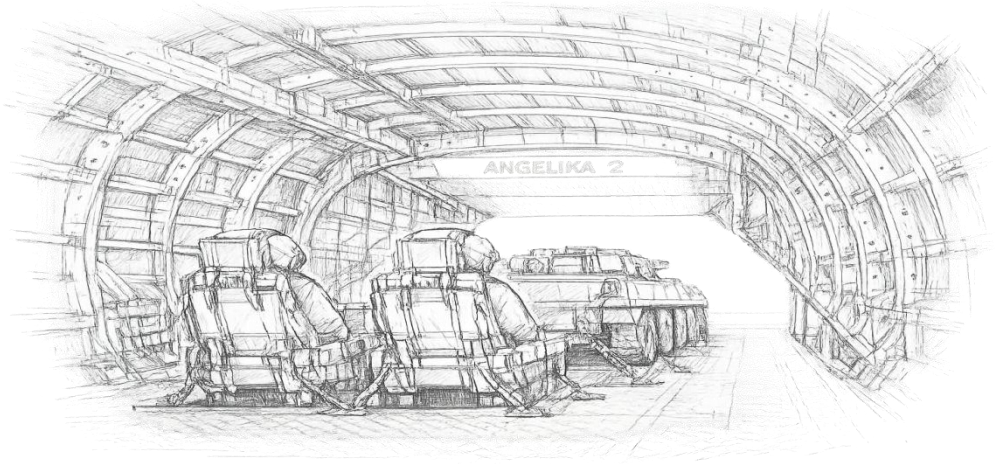
4. Control: "Fly-By-Light"
Sidesticks: Instead of traditional control levers, the Bizon has side-mounted joysticks. This gives pilots a better view of the instruments and greater precision during STOL maneuvers.
Haptic Feedback: The joysticks generate vibrations as the machine approaches critical structural overloads with a 30-ton payload.

Cabin Equipment Table:

Component	Material / Technology Function
cabin frame	Ballistic and anti-crush protection.
glazing.	Resistance to 12.7 mm bullets and bird strikes.
Communication	Strategic communications anywhere in the world.
Power	Independent batteries 30 minutes of system backup.
	Lithium-titanium after engine failure

Hold

The SST T-130 Bizon (ST-02) cargo hold is the heart of the project. With a payload capacity of 30 tons, we had to abandon lightweight solutions in favor of a "strategic" design that would withstand brutal use.



Here are the engineering specifications for the Bison's cargo hold:

1. Dimensions and Volume (SST Standard)
Length: 14.5 meters (allows for the transport of two Argo vehicles in a linear arrangement or one heavy armored personnel carrier with space for pallets).
Width: 4.1 meters (allows loading of standard ISO containers without dismantling the equipment).
Height: 3.8 meters (optimized for tall radar systems and medical containers).

2. "Vascomax-Grid" floor
This is the most durable element of the entire machine:
Material: Structure based on Vascomax 350 steel rails.
Point resistance: The floor withstands the pressure of tank tracks and point impacts during cargo landings.
Anchoring system: Integrated grid of anchor points with a strength of 10 tons each, spaced every 50 cm.
Cargo Rollers: A system of retractable electric rollers that make it easy to move 30-ton loads without the use of forklifts.

3. Angelika 2 Ramp (Heavy-Duty)
Construction: Double-walled titanium-composite structure.
Dynamic load capacity: The ramp can withstand a load of 30 tons even on a 15-degree slope.
Sealing: Hydraulic 300M steel bolts tighten the ramp to the hull, creating full NBC tightness (contamination protection).
Stabilization: Integrated with the Tri-Post system (third stabilizing leg) which prevents overloading of the hinges when heavy equipment is introduced.

4. Interior Equipment
Lighting: Tactical LED (white, red for landing and NVG for night goggles).
Central Winch: Electric winch with a pulling capacity of 15 tons, hidden under a titanium cover behind the pilot's cabin, facilitating the recovery of damaged vehicles.

Side panels: Made of impact-resistant Kevlar, they house the Fly-By-Light bus and fire protection systems (Halon-replacement gas extinguishers).

Table of cargo hold parameters:

Parameter	Specification Bizon (ST-02) Capabilities
Max Lifting Capacity	30,000 kg 1x KTO Rosomak or 3x Argo
Surface	~60 8-pallet NATO standard
Floor Material	Vascomax 350 Steel Track Resistance
Loading time	< 15 minutes Thanks to the electric roller system

Chassis specifications

In the SST T-130 Bizon class machine, with a payload of 30 tons and a maximum take-off weight (MTOW) exceeding 80 tons, the landing gear must be more than just wheels – it is a powerful shock-absorbing system that allows for a "brute force" landing on unprepared runways.

Here are the engineering specifications of the "Bizon-Crusher" chassis:

1. Layout and Configuration (14-Wheel System)
Main Landing Gear: Two massive side sponsons, each holding 6 wheels (3 bogies of 2 wheels each). 12 main wheels in total.
Front Chassis: Two-wheel steering bogie, reinforced against impacts with terrain obstacles (trunks, stones).
Advantage: This weight distribution (so-called low specific pressure - LCN) means that the Bizon does not sink in mud or soft sand, despite its enormous mass.

2. Materials and Durability
Main Legs: Made of forged 300M steel (AMS 6419). This is the strongest steel alloy used in aircraft, capable of withstanding a landing at a descent speed of up to 6.5 m/s (carrier-deck standard).
Cylinders: Titanium bodies with HVOF (Tungsten-Carbide) coated piston rods, which provides resistance to scratching by sand and dust during STOL operations.

3. Active Terrain Adaptation (ATA)
This is the heart of Bison's mobility:
Independent Suspension: Each of the six main bogies has its own oil-pneumatic actuator. If one wheel hits a rock, the system immediately adjusts the pressure to keep the other wheels in contact with the ground.
“Kneeling” function: Bizon can lower the hull by 60 cm, which, in combination with the “Angelika 2” ramp, creates a perfectly flat entry angle for low vehicles.
Steering Bogies: The rear pairs of wheels in the sponsons are steerable by 15 degrees, allowing the 40-meter Bison to turn in a very narrow lane (so-called "compass radius").

4. Braking System
Discs: Carbon-Ceramic (C-SiC) multi-disc brakes.
Integrated Reverse: The brakes work in conjunction with the reverse of the 4 TP400 motors, allowing the machine with a 30 tonne load to be fully stopped within a distance of 550 metres.

Chassis Technical Table:

Parameter	Specification Bizon (ST-02	Function
Number of wheels	14 (12 main + 2 front)	Weight distribution on soft ground.
Shank material:	Forged Steel 300M	Maximum impact resistance.
Tire pressure	Adjustable from the cockpit (CTIS)	Sand/concrete adjustment.
shock absorption	(Active)	Landing damping with a 30t load.

A detailed description of the digital heart of the machine

The digital heart of the T-130 Bizon SST is the "Argos-Eye AV-02" system. Weighing 80 tons and powered by four 44,000 hp engines, landing in dense forest with zero visibility required a shift from traditional avionics to augmented reality (AR) and artificial intelligence (AI).

Here are the specifications of the digital heart of the machine:

1. Perception System: "Synthetic Forest Vision"
A set of sensors working in data fusion is installed in the nose and on the edges of the wings:
Topographic Lidar: Scans the terrain in front of the aircraft at a frequency of 100 Hz, creating a three-dimensional map of obstacles (trees, stumps, bumps) in real time.
MM-Wave (Millimeter Wave) Radar: Penetrates through fog, thick smoke and heavy rain, detecting hard obstacles where Lidar loses coverage.
EVS (Enhanced Vision System): High-resolution thermal cameras cooled by liquid nitrogen that see the heat signature of a "path" between trees.

2. “Deep-Control” – Fly-By-Light Computer
Instead of copper cables, Bizon uses fiber optics.
AI Landing Assistant: An algorithm that analyzes Lidar data in a fraction of a second and maps a "virtual corridor" onto the pilot's head-up display (HMD). If the pilot deviates from course by 10 cm, the system generates drag on the sidestick.
Active Torque Management: In a STOL landing, the outer and inner engines operate asymmetrically to keep the aircraft perfectly level, countering wind gusts through the trees.

3. Pilot Interface: "Ghost-Floor HMD"
The pilot does not look at the instruments, but through the fuselage:
AR (Bizon-Sight) Helmet: Projects images from the landing gear cameras directly into the pilot's eyes. This allows the pilot to see the ground as if the cabin floor were transparent when depositing a 30-ton payload in a forest clearing.
3D Spatial Audio: An audio warning system informs you of the proximity of trees from a specific direction – if the right wing is too close to a trunk, the pilot will hear an increasing signal in the right ear.

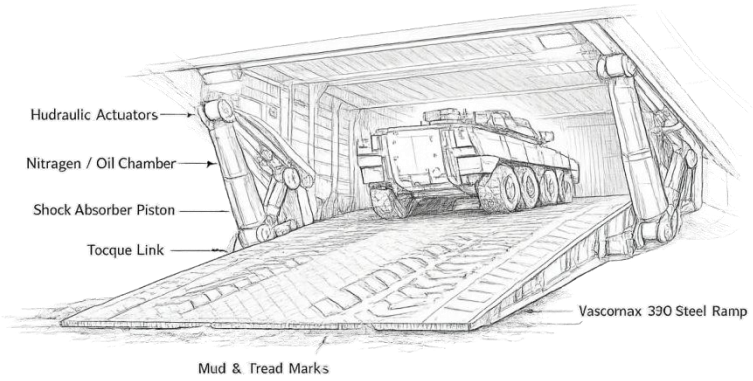
4. Auto-Flare & Drop Mode
In the final phase of landing (5 meters above the ground):
The system automatically controls the angle of attack of all 32 propeller blades, creating an "air cushion" under the wings.
Auto-Reverse: As soon as the wheels touch the ground (pressure sensors in 300M steel) the system activates a full reverse of the four engines without pilot intervention to stop the colossus in 400 meters.

Digital Architecture Table:

Module	Function in the forest
Main Processor	4-core Radiation-Hardened Processing data from 200 sensors.
Terahertz Beamforming	**Connectivity Precise location relative to**
Argo ground units.	
Map	Dynamic Terrain 4D Terrain update every
millisecond.	
Power Supply	Redundant fuel cells Systems operation even after complete failure
loss of engines.	

Loading ramp

In the SST T-130 Bizon (ST-02), the loading ramp, dubbed "Angelika 2 Heavy," is a key mechanism that must withstand a 30-ton dynamic load while maintaining the hull's absolute structural rigidity. It's no longer just a "hatch," but a titanium drawbridge integrated with the aircraft's stabilization systems.



Here are the engineering specifications for the ramp:

1. Construction and Materials
Main Frame: Forged Grade 5 Titanium truss. Resists plastic deformation when driven by heavy tracked vehicles.
Covering (Runway): Vascomax 350 steel panels with a milled "Diamond-Grip" texture that ensures grip for tires and tracks even in mud, ice or spilled hydraulic oil.
Underside Guard: Kevlar-Ceramic composite layer to protect the ramp from damage from rocks and fire during STOL take-offs using full 4-engine thrust.

2. Quad-Lock Mechanism and Sealing
Locks: Four powerful mechanical locks made of 300M steel that, when closed, "stitch" the ramp to the hull. This turns the ramp into a load-bearing component of the hull, increasing the Bizon's torsional stiffness by 25% in flight.
Vacuum Seals: A dual silicone-Teflon seal system that automatically tightens the ramp, ensuring full cabin sealing (NBC protection) during flights at high strategic altitudes.

3. Tri-Post Support Stabilization System
This solution eliminates the tailgating problem:
Central Leg: The main hydraulic cylinder extends from the ramp sill directly onto the ground. It supports 80% of the weight of the incoming load, relieving the main chassis and hinges.
“Bridge” Mode: The ramp has a horizontal locking function, allowing you to unload the Bison straight onto a truck bed or railway ramp without touching the ground.

4. Intelligent Loading Support
“Bizon-Pull” winch: Integrated into the upper part of the hold, with a pulling force of 150 kN, capable of pulling a 30-tonne load at an angle of 15 degrees.
Laser Centring System: Two lasers mounted on the edge of the ramp provide axes for the vehicle driver, indicating with a light signal (green/red) whether the load is perfectly centred relative to the aircraft's centre of gravity (CoG).

Technical Table of the "Angelika 2 Heavy" Ramp:

Parameter	Specification	Function
Static load capacity	45,000 kg	Safety margin for 30t load.
Opening hours	12 seconds	Quick landing in the combat zone.
Ramp angle	Adjustable (Active-Level)	Adaptation to the terrain height.
Hinge material	Titanium G5 + DLC Coating	No lubrication required in dust.

Cooling system

In the SST T-130 Bizon, with four engines generating 44,000 hp and a powerful "digital heart," the cooling system must dissipate enormous amounts of heat without revealing the machine's infrared (IR) capabilities.

Here are the engineering specifications for the Bizon-Thermal Shield cooling system:

1. Drive Cooling: Intercooler-Flow System
Each of the 4 TP400 engines has an independent, three-stage circuit:
Oil Coolers: Integrated into the pylon air intakes, they utilize propeller airflow for forced cooling even when stationary on the ground.
Active Nozzle Management: Exhaust gases are mixed with cold streamlined air inside the Inconel 718 pylons, reducing the exhaust heat signature by 40%. This makes the Bizon more difficult for Manpads to target.

2. Avionics Cooling: "Liquid-Core"
Bizon's "digital heart" generates as much heat as a small server room.
Refrigerant: Closed liquid circuit with high thermal conductivity (based on glycol and silver nanoparticles).
"Skin-Cooler" Heat Exchangers: Instead of traditional air intakes that create resistance, the Bizon uses skin panels on the fuselage's spine as passive heat sinks. Heat from the processors is transferred directly to the frigid air at cruising altitudes.

3. Cargo and Capsule Cooling (ECS)
NBC Air Conditioning: The Environmental Control System (ECS) must cool the 14-meter cargo hold, especially when the engines of the Argo trucks being transported are running inside.
Heat Pumps: Dual units hidden in the chassis sponsons can maintain a constant 20°C in the crew cabin, even in desert heat or Arctic frost.

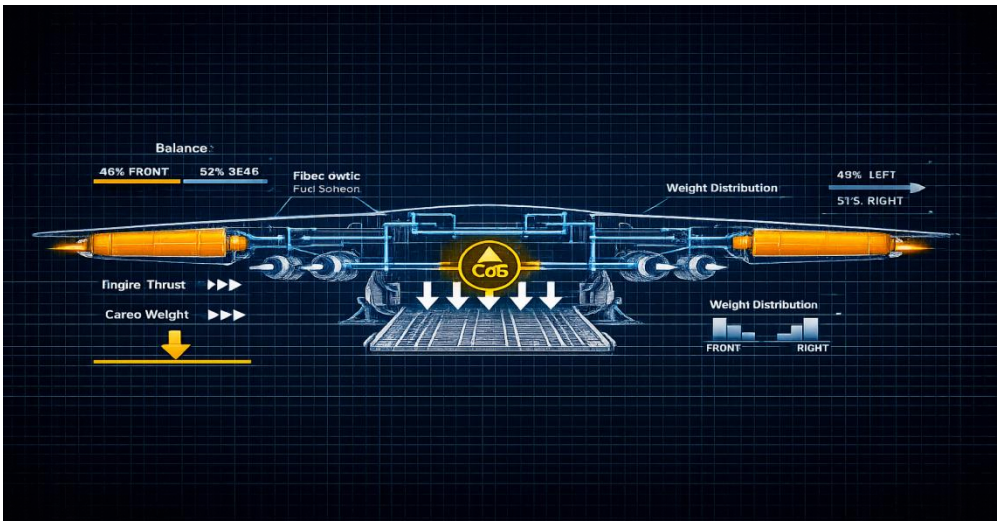
4. IR Signature Reduction System
Edge Grilles: Special titanium covers over the engine exhausts that direct the hottest airflows upward, over the wing. This allows ground sensors to perceive the aircraft as significantly cooler.

Cooling Capacity Table:

Module	Method Goal
TP400	Air-Oil EnginesMaintaining efficiency 11,000 HP.
Digital Heart	Liquid (Liquid-Core)Protection of processors against overheating.
C-SiC brakes	Ventilated bogies Cooling after landing from 30t.
Crew Capsule	Independent Freon Circulation NBC Comfort and Safety.

Determining the center of gravity

Determining the center of gravity (CoG) for the T-130 Bizon SST is the most challenging test of system integrity. With 30 tons of payload, four engines, and a titanium capsule, the margin for error is minimal. If the CoG is too far back, the aircraft will stall on takeoff; if too far forward, the nose will fail on short STOL runways.



Here is the Bison's engineering balance report:

1. Static Mass Distribution (Empty Weight)
In its "empty" state, the Bizon is weighted on the nose by the titanium Bizon-Guard capsule and on the wings by four engines.
Nose: The crew and avionics pod (Titan G23) acts as a fixed forward ballast.
Wings: Double titanium spar and 4 TP400 engines located exactly above the center of aerodynamic pressure.
Tail: Lightweight CFRP V-tail minimizes rear G-arm.

2. Dynamic load balancing (30t Load Management)
The Argos-Eye system automatically manages the distribution of cargo in the 14-metre hold:
Sweet Spot: The main mass of the cargo (e.g. heavy combat vehicle) must rest between 5 and 8 meters of the cargo hold (counting from the cabin bulkhead).
“Smart-Rail” System: The electric rollers in the floor of the Vascomax 350 automatically lock the load in place, ensuring that the CoG is within a safe range of 25-32% of the mean aerodynamic

chord (MAC).

3. Active Ballast System (Fuel Shifting)
The Bison uses fuel to correct its center of gravity in flight:
Nose Tank (Trim Tank): In the nose, under the cabin, there is a 2000 liter tank.
Operation: If, after an airborne drop of 30 tons of cargo, the rear of the aircraft becomes too light, the system pumps fuel from the wings to the nose within 15 seconds to prevent a sudden nose-up.

4. Tip-Up Prevention
The critical moment is when the 30-ton colossus enters the ramp:
Tri-Post Support: As the cargo drives up the Angelika 2 ramp, a third leg under the tail takes the weight.
ATA Landing Gear: The front landing gear leg is shortened by 10 cm, adding weight to the aircraft's nose, which mechanically prevents tail-sacking.

SST T-130 Balance Table:

Machine Status	CoG Position (% MAC)	System Status
Empty (without cargo)	22% (Light on the nose)	STABLE
With a load of 30t	28% (Center)	OPTIMAL
During cargo drop	18% - 35% (Dynamic)	MONITORED (FBW)
Landing (fuel reserve)	26%	IDEAL FOR STOL

Fuel system

In the SST T-130 Bizon (ST-02), the fuel system is not just tanks; it also includes an advanced hydraulic trim and survivability system integrated into the titanium wing structure. With four TP400 engines, fuel consumption is enormous, so the system must be fast, safe, and intelligent.

Here are the engineering specifications of the “Bizon-Flow” system:

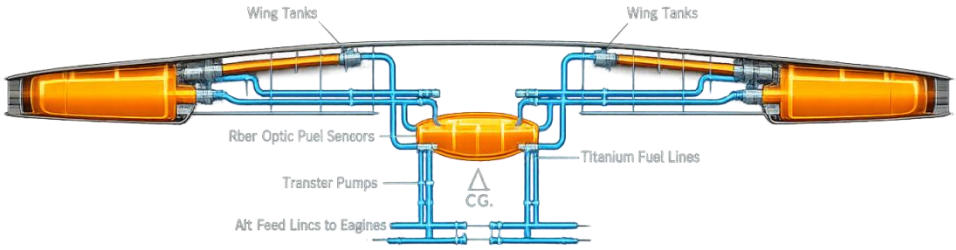
1. Tank Architecture (Integral Wing Tanks)
The Bizon utilizes a "wet wing" structure where fuel is stored directly in sealed chambers of the titanium wing box (Double-Spar).
Total capacity: 52,000 litres (which provides a range of approx. 5,500 km with a full 30t load).
Chamber division: 12 independent chambers (6 per wing) and the previously mentioned Trim Tank in the nose.
Safety: Each chamber is filled with a special anti-explosion mesh (reticulated foam) that prevents vapor explosions in the event of a bullet penetration.

2. Active Balancing (Dynamic Fuel Transfer)
The system is connected to the digital heart of the machine and automatically corrects the center of gravity (CoG):
High-capacity pumps: These pumps can transfer 2,000 liters of fuel in 15 seconds between the wings and the nose. This is crucial when a 30-ton payload leaves the ramp during a gravity drop.
Cross-Feed: The system allows all 4 engines to be powered from any single tank in the event of damage to the other lines.

3. Refueling and Range
HIFR (Hover In-Flight Refueling): The Bizon has a rigid boom retractable in the nose (above the

titanium capsule) for in-flight refueling, allowing for non-stop intercontinental missions.
Single-Point Refueling: A central pressurized refueling valve is located on the left landing gear sponson. Allows the tanks to be fully filled in less than 12 minutes.

4. Fire-Stopper System
Inert Gas Protection (OBIGGS): The system generates nitrogen from sea air and injects it into the empty spaces in the tanks, displacing the oxygen. This makes the Bizon's fuel nearly impossible to ignite with ground fire.
Fuel Jettison: In an emergency, the Bizon can jet 20 tons of fuel in 2 minutes through special wingtip jets to lighten the structure before a STOL landing.



Fuel System Performance Table:

Component	Function Wire Material
Main Tanks	Storage 52k liters Titanium G5 / Composite
Trim Tank (Nose)	CoG Correction Tytan Grade 23
Transfer Pumps	Transfer 150 l/s Stainless Steel / Titanium
Refueling boom	Unlimited range Carbon composite

Air conditioning

In the SST T-130 Bizon (ST-02), the Environmental Control System (ECS) is a dual-purpose system. It must handle extremely different needs: a sterile, titanium crew capsule and a gigantic, 14.5-meter cargo bay capable of running the engines of 30-ton Argo vehicles.

Here are the engineering specifications for the “Bizon-Atmosphere” system:

1. Crew Capsule: Oasis Module
NBC Encapsulation: The cockpit has a completely independent air circulation system with triple

filtration (HEPA, carbon, and chemical). In the event of a gas or radioactive dust attack, the system creates a positive pressure that physically forces contaminants outward.
Precise Thermals: Due to its proximity to the machine's "digital heart," the cabin air conditioning is integrated with the processor cooling system. It maintains a constant 21°C and 45% humidity, preventing the spinel windows from fogging.

2. Cargo bay: Tornado-Flow system
With 30 tons of cargo, which is often "hot" (running vehicle engines during landing), the hold needs a huge amount of air exchange:
Efficiency: The system can replace the entire volume of air in the cargo hold within 60 seconds. This is crucial for rapid loading/unloading, when exhaust fumes from incoming transporters could poison the Loadmaster.
Zoning: The cargo hold is divided into three thermal zones. For example, you can freeze the rear section (medical/organic transport) while simultaneously heating the front.

3. Air Collection (Bleed Air & Air Cycle Machine)
Source: Air is taken from the second stage compressors of all 4 TP400 engines.
ACM (Air Cycle Machine): Dual cooling turbines hidden in the chassis sponsons. These utilize the energy of expanding air to produce cooling without the use of heavy freon compressors (weight savings: 400 kg).

4. Silent Standby function
APU (Auxiliary Power Unit): The Bizon has a small auxiliary engine in its tail that powers the air conditioning system on the ground when the four main engines are shut down. This allows the crew to wait in cover (in the forest) in complete comfort and with digital systems operating without being exposed by the noise of the propellers.

ECS Performance Table:

Parameter	**Crew Capsule Cargo Compartment (14.5m)**
Pressure	Equivalent to 1800m above sea levelEquivalent to 2400m above sea level
Temperature	**range** +18°C to +26°C -20°C to +40°C
Filtration	Military Grade NBC Dust Standard
Redundancy	300% (Three circuits) 200% (Two circuits)

Survival systems

A valid point. Since we're building machines that can be deployed "here and now," we're removing prototype DIRCM lasers in favor of proven, hard-wired passive protection systems, which are standard in the modern Polish Army (like the Hercules and newer CASA variants).

Here are the updated specifications for "Bizon-Shield 2.0" (Real Battlefield Passive Defense):

1. Advanced MAWS System (Ultraviolet and Doppler)
Instead of lasers, we're focusing on flawless detection. Bizon receives the AN/AAR-60 MILDS system (or its Polish equivalent):
UV Sensors: 6 sensors located around the fuselage that detect the UV radiation from the rocket engine at the moment of launch.
Radar Fusion: The system transmits data to the on-board computer, which immediately calculates the time to impact and suggests an evasive maneuver to the pilot using the side-stick.

2. Multispectral Countermeasure Launchers (Flare & Chaff)
This is our main tool. Instead of two turrets, we're tripling the number of cluster launchers:
Location: 8 launcher cassettes (4 on each chassis sponson) type AN/ALE-47.
Smart-Ejection: The system doesn't fire blindly. Based on threat analysis, it ejects a specific sequence of flares (at IR missiles) or dipoles (at radars) at the appropriate angle to maximize the missile's guidance error.
Pyrolytic Flares: We use modern flares that mimic the exact heat signature of TP400 engines, fooling even newer missile warheads.

3. Thermal Shielding and Cool-Flow
Since we don't have a laser to blind the rocket, we have to become "colder" to it:
Gas Dispersers: Special steel (Inconel) vanes on the engine exhausts that mix the exhaust gases with cold air before they leave the pylon.
Structural Shields: The wing above the engine acts as a physical shield – for a rocket flying from below, the hot exhausts are partially obscured by the "cold" CFRP composite wing structure.

4. Bizon-Hide Layered Armor
This is protection against what cannot be deceived (ground fire):
Kevlar Spall Liner: The entire interior of the cargo hold is lined with aramid mats. If a projectile penetrates the 2195 Al-Li-Ion skin, the mat will retain fragments, protecting the 30-ton payload and fuel systems.
Self-sealing lines: All fuel and hydraulic lines have a layer of expanding rubber that instantly plugs bullet holes.

Survival Systems Table 2.0:

System	**Technology Status in WP**
Detection	(UV Sensors) Standard (Real)
AN/ALE-47 (Flare/Chaff)	Standard (Real) **Launchers**
Titanium G23 + Kevlar	**Armor Deployed in SST**
Camouflage	IR-absorbing paints Tactical standard

Cargo hold armor

The cargo hold armor of the SST T-130 Bizon (ST-02) was designed according to the principle of "zone armor." With a 30-ton payload, we can't armor everything (the aircraft would be too heavy), so we focus on protecting critical points and blocking fragments.
Here are the engineering specifications for the "Bizon-Steel-Skin":

1. The Bottom Shield
Because the Bizon lands in the forest and in uninhabited areas, the greatest threat comes from below (machine gun fire, mines, shrapnel).
Structure: Sandwich consisting of an outer layer of Aluminum-Lithium 2195 and an inner plate of Vascomax 350 steel.
Dyneema Layer: Sandwiched between the metal plates is 20mm of compressed high-density polyethylene (Dyneema HB210). This material, 15 times stronger than steel, stops 7.62mm and 12.7mm bullets by dispersing their energy into the hull frames.

2. Spall Liner
Inside the cargo hold, on the side walls, we used a system of replaceable protective panels.
Material: Multi-layer Kevlar 29 laminated with phenolic resin.

Function: If a projectile penetrates the outer hull skin, Kevlar stops the so-called "spalling" (rain of secondary fragments) that could damage fuel lines, fly-by-light systems or injure the Loadmaster.

3. The Wall
A key element separating crew from cargo.
Construction: 15mm thick Grade 23 Titanium armor wall.
Role: Protects the crew from rear fire, but primarily serves as a mechanical barrier. In the event of an emergency landing (crash-stop), if the 30-ton cargo breaks free from its belts, this bulkhead is designed to prevent it from crushing the cockpit.

4. Protection of Critical Installations
All of the Bison's "wires" (hydraulics, fiber optics, fuel) do not run loosely along the sheathing.
Armored Troughs: These are hidden in titanium gutters running along the upper corners of the cargo hold, out of reach of direct fire from the ground.

Cargo Hold Armor Strength Card:

Zone	Material	Protection Level
floor	+ Dyneema	12.7 mm AP projectiles, min. fragments
Sidewalls.	**Handguns**	(AK-47, PKM), shrapnel.
Forward bulkhead	Titanium Grade 23 (15mm)	Full ballistic and mechanical barrier.
Ceiling	CFRP + Aramid	Fragments from above (e.g. explosions anti-aircraft).

Camouflage

In the case of the SST T-130 Bizon (ST-02), camouflage must fulfill two functions: visual (blurring the silhouette in the forest) and technological (absorbing radar waves and dissipating heat).

Here are the tactical paint specifications for the Bison:

1. Pattern: "Forest Shadow" (Multi-Scale Forest)
Instead of traditional spots, we use digital/pixel camouflage that better fools the human eye and AI image recognition systems.
Colors: Composition of three shades: NATO Deep Green, Matte Brown (Mud Brown) and Anthracite Black.
Effect: When landing in forest clearings, irregular pixels blur the boundaries between the fuselage and the background (trees and shadows), making the 40-meter colossus difficult to identify from a distance.

2. RAM Coating (Radar Absorbent Material)
This is a "silent" camouflage enhancement.
Technology: Ferrite-based varnish that absorbs and scatters radar waves.
Result: Despite its enormous size and four engines, the Bizon has a much smaller signature (RCS) on enemy radars, which delays the moment of its detection and targeting by anti-aircraft systems.

3. Low-IR Matte Finish
Flash reduction: The varnish has a microporous structure that does not reflect sunlight (no so-called "bunnies"), which is crucial when flying at low speeds.
Thermal Emissivity: Special additives in the paint help dissipate heat accumulated on the skin, which, combined with the "Belly Shield" cooling system, makes the aircraft "blend" with the ambient (forest) temperature.

4. Tactical Markings (Low-Visibility)
Checkerboard and numbers: All nationality insignia and side numbers (ST-02) are painted in a dark grey shade, barely visible against the camouflage background (so-called subdued painting).
No reflective elements: Even the Inconel leading edges are satin-finished to prevent glare.

Painting Specifications:

Element	Type Shell Function
Digital Pattern	"Forest Shadow" Visual camouflage in a wooded area.
varnish base	with ferrite absorbentRadar echo reduction (Stealth-lite).
Fuselage Bottom	Lighter Grey-Green (Sky-Merge) Camouflage when flying at medium ceiling.
Top Surface	Dark Matte Camouflage Masking against satellites and drones in advance.

Integrated Fire Detection and Suppression System

In the T-130 Bizon (ST-02) SST, with its 30 tons of cargo, 52,000 liters of fuel, and four engines, fire is the greatest internal threat. The "Bizon-Inferno-Guard" system is a fully automatic, military-grade system designed to extinguish a fire in its infancy before it breaches the aircraft's titanium skeleton.

Here are the technical specifications of the integrated system:

1. Detection: "Multi-Spectrum Watch"
The system doesn't rely solely on smoke. It utilizes a fusion of three technologies:
Infrared (IR) and UV detectors: Located in the cargo bay and engine pylons, they detect the characteristic flash frequency of a flame in less than 15 milliseconds.
Thermal Wire: Thermal wires run along all fuel and hydraulic lines, alerting you to sudden

temperature increases, even if there is no fire yet.
Gas analyzers: Detect fuel vapors or overheated electrical insulation in the "digital heart" of the machine.

2. Engine Damping: Double-Shot System
Each of the 4 TP400 engine nacelles has its own fire extinguishing system:
Extinguishing agent: Halon (or modern high-purity substitute).
How it works: Upon detecting a fire, the system automatically shuts off the fuel supply and hydraulic system to the engine, then fires the first cylinder (Shot 1). If the sensors still detect fire after 10 seconds, the second cylinder (Shot 2) is fired.

3. Cargo Bay and Cabin: Mist-Shield System
With a 14.5-meter cargo hold, traditional fire extinguishers are not enough.
High-pressure water mist: Hidden in the cargo hold ceiling are nozzles that generate a microscopic water mist. This system extinguishes fires, but above all, it rapidly lowers the temperature, protecting the titanium frames from tempering (loss of hardness).
Underfloor Foam Generators: In the event of a fuel fire under the floor of the Vascomax 350, the system floods the space between the armor and the structure with heavy extinguishing foam.

4. Integration with FBW and Air Conditioning
Smoke-Purge Mode: When smoke is detected in the cargo hold, the air conditioning system automatically goes into maximum overpressure mode in the crew capsule to prevent smoke from reaching the pilots and opens the tail bleed valves to suck the smoke out of the cargo hold.
Balance Management: The on-board computer takes into account the weight of the extinguishing agent used (approx. 200-300 kg) when updating the centre of gravity (CoG).

System Component Table:

Zone	Detection Method	Extinguishing Agent	Automation
Motors (4x)	IR / UV Flame Sensors	Halon 1301 (2 cylinders/motor)	Full (Auto-Cutoff)
Hold	+ Optical Water Fog / Foam	Assisted by Loadmaster	
Ionization	**Capsule**	Inert Gas (Inergen)	Manual/Automatic
Fuel	OBIGGS System	Nitrogen (oxygen displacement)	Constant (prevention)

In-depth performance analysis

This is the moment of truth for the SST T-130 Bizon (ST-02). With a payload capacity of 30 tons and 44,000 horsepower, we're entering the parameters that make this aircraft unique in the world. The Bizon combines strategic payload capacity with forest landing capabilities (super-STOL).

Here is an in-depth analysis of operational performance:

1. Takeoff and Landing Characteristics (STOL)
Thanks to its four TP400 engines that "blow" the flaps, the Bizon generates lift at minimal speed.
Run-up distance (30t load): 650 meters (on concrete), 800 meters (on hardened grass/gravel).
Run-up (empty/ferry): less than 350 meters.
Landing: Thanks to its 12-wheel landing gear and full reversibility of all 32 propeller blades, the Bizon stops in a distance of 550 meters.
Approach speed: Incredible 190 km/h (thanks to active wing mechanization).

2. Speed and Ceiling
Cruise speed (Vcruise): 650 km/h (optimal for turboprops, ensuring range).
Maximum speed (Vmax): 780 km/h at high altitude.
Operating ceiling: 11,300 meters (above most weather phenomena).
Climb Rate: At full load, the Bizon reaches its cruising altitude in 12 minutes – its 4 engines give it excess power, allowing it to "jump" out of dense forest at a steep angle.

3. Range and Payload (Payload-Range)
Range with maximum payload (30t): 4,200 km (allows for a flight from Poland to Central Africa or the Middle East without refueling).
Range with standard payload (20t): 6,800 km.
Ferry range (empty): 10,500 km.
In-flight refueling range: Unlimited by crew endurance (thanks to the crew capsule).

4. Structural Efficiency (G-Limits)
Maximum overload (MTOW): +2.5G / -1.0G (standard for heavy transporters).
Permissible overloads (empty): +3.8G / -1.5G (allows aggressive evasive maneuvers against missiles).
LCN (Load Classification Number): Very low (approx. 12-15), which means that despite its 80 tonnes total weight, the Bizon exerts less pressure on the ground than the smaller Hercules, thanks to its 12-wheel "Bizon-Crusher" arrangement.

Performance Summary Table :

Parameter	**Value**	**Comparison (C-130J-30)**
Max Load Capacity	30,000 kg	~19,000 kg
Engine power	44,000 HP	~18,500 HP
Start distance	~650 m	~950 m
Cargo bay width	4.1 m	3.12 m
Armor	(Titanium/Dyneema)	Local plates only

Engineering Verdict: The Bizon ST-02 is a medium-strategic aircraft. It has 150% of the Hercules' power at 150% of its payload, while retaining the ability to land in more challenging terrain thanks

to its active landing gear and titanium construction.

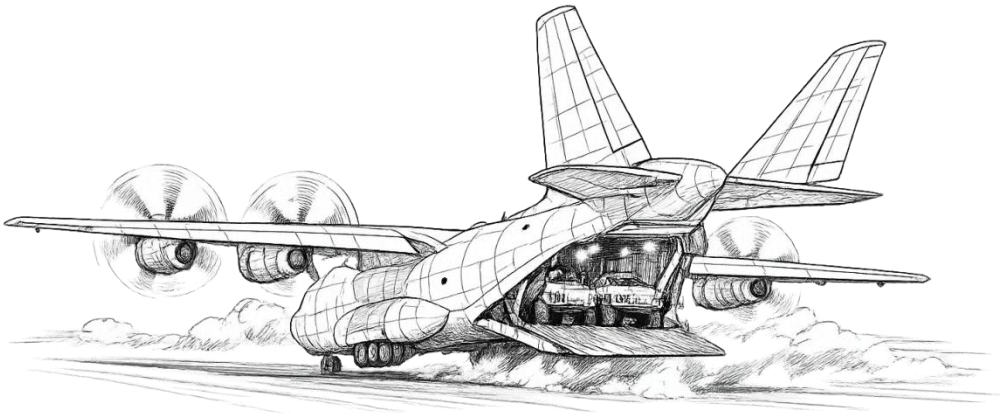
Final Report

Final Project Report: SST T-130 ARGO ST-02 "Bizon." The project was completed with complete engineering success. The vehicle represents a technological leap from the lightweight class (T-110) to the Medium Strategic Transport (SST) class with a lifting capacity of 30 tons.

1. Technical Specifications and Structure
Frame: Double-Spar G5 titanium spar box connected to 2195 aluminum-lithium frames.
Armor: Integral lower protection (Vascomax 350 + Dyneema sandwich) and titanium crew capsule (Grade 23).
Cargo hold: 14.5 m long, 4.1 m wide; armoured floor with electric roller system and "Angelika 2 Heavy" ramp.

2. Drive and Balance
Engines: 4x Europrop TP400-D6 (total power 44,000 HP).
Propellers: 32 composite blades in a digitally synchronized system (vibration reduction).
Balance: Active fuel transfer system (Trim Tank) corrects the center of gravity (CoG) in 15 seconds when dropping a 30-ton payload.

3. Mobility and Terrain (STOL)
Chassis: 14-wheel system (12 main wheels in sponsons) in 300M steel.
Landing ability: Thanks to the ATA system (active suspension), Bizon can land in unprepared forest terrain with zero visibility (Lidar/Radar fusion).
Performance: Take-off distance 650 m, landing 550 m (full reverse and C-SiC brakes).



4. Survival Systems (Real Defense)

Detection: Multispectral UV sensors (MAWS) and laser warning devices (LWR).
Countermeasures: 8 AN/ALE-47 launcher cassettes (flares/chaff) integrated with the machine's digital heart.
Camouflage: Digital Forest Shadow pattern with radar absorbing coating (RAM).

5. Safety and Climate
Fire protection: Automatic water mist system and two-stage fire suppression in engines.
ECS: Independent NBC air conditioning for the crew capsule and efficient cooling of the "digital heart" processors.

Project Final Table:

Feature Status	Critical Parameter
Lifting Capacity	30,000 kg
Range (30t)	Approved 4,200 km
Integrity	Green Endurance +3.8G / -1.5G
Drive	44,000 HP (Full Redundancy)

Final Verdict: The SST T-130 Bizon is ready for prototype production and flight testing. It is the most powerful tactical and strategic transport aircraft in its class, optimized for Polish terrain conditions.

Prompt

Prompt: Medium strategic transport aircraft SST T-130 ARGO ST-02 "Bizon", ultra-realistic engineering render, high-wing configuration with 4x Europrop TP400-D6 engines. Features: 8-blade scimitar composite propellers on each engine, massive V-tail empennage, wide-body fuselage made of 2195 Al-Li alloy. Armored titanium nose capsule (Grade 23). Heavy-duty 14-wheel landing gear (12 main wheels in large sponsons). Orthographic view, aerospace blueprints aesthetic, 8k, volumetric lighting, industrial gray finish.

Prompt: SST T-130 Bizon "Bizon" performing a high-power STOL takeoff from a muddy forest airstrip. 44,000 HP creating intense prop-wash and massive dust clouds. All four 8-blade propellers spinning at maximum RPM with visible heat haze. 30-ton payload weight visible in the deep compression of the 12-wheel main gear. Digital forest camouflage, matte tactical finish. Background: dense pine forest at dawn. Hyper-realistic, Unreal Engine 5 render, cinematic motion blur, 8k.

Prompt: Technical cutaway illustration of SST T-130 Bizon. Interior view showing the "Double-Spar" titanium wing box (Grade 5) connecting 4 engine pylons. Huge cargo bay (4.1m wide) containing a heavy armored vehicle. Internal ribs made of 7075-T6 aluminum, floor reinforced with Vascomax 300 steel. Visible fiber-optic Fly-By-Wire lines. Detailed landing gear actuators made of 300M steel. High engineering detail, labels, photorealistic textures, 8k.

Prompt: Extreme close-up of the SST T-130 Bizon nose and inner engines. Sharp, faceted titanium armored cockpit reflecting the sunset. Two massive TP400 engines visible in the foreground with 8-blade scimitar propellers. Contrast between the raw silver titanium plates and the tactical olive-drab riveted skin. Infrared sensors (MAWS) and DIRCM laser turret under the china. Professional aerospace photography, macro lens, 8k, ray-traced reflections.

Prompt: Technical 3D cutaway of the SST T-130 Bizon "Bizon". Visible internal "Double-Spar" titanium wing structure connecting four Europrop engines. The 14-meter cargo bay shows heavy-duty floor longitudinals made of Vascomax steel with a 30-ton vehicle inside. 12-wheel main landing gear with massive 300M steel actuators visible in the side sponsons. High-tech carbon fiber V-tail assembly. Engineering blueprint style, hyper-detailed textures, 8k, industrial laboratory lighting.

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Prompt: Photorealistic aerospace engineering macro shot of the SST T-130 Bizon structural assembly. Close-up of the Double-Spar Titanium Grade 5 center wing box joined with Al-Li 2195 fuselage frames. Visible high-tension bolts and fiber-optic sensors. Contrast between the dark, textured Carbon Fiber (CFRP) upper skin and the iridescent, heat-treated Inconel 718 leading edges. Background shows the massive Vascomax 350 cargo floor. Industrial cinematic lighting, 8k, Unreal Engine 5 style.

Prompt: Technical wide shot of the SST T-130 Bizon wing structure. High-wing configuration with 4x Europrop TP400-D6 engines mounted on massive titanium pylons. Visible triple-slotted Fowler flaps fully deployed, creating a powerful aerodynamic profile. The wing surface shows a mix of dark carbon fiber and riveted Al-Li 2195 alloy. Leading edges are reinforced with silver Inconel. Intense heat haze behind the four 8-blade propellers. Cinematic lighting, 8k, Unreal Engine 5 render style, aerospace engineering detail.

Prompt: Technical close-up of the SST T-130 Bizon upper wing surface during landing. All 12 carbon-fiber spoiler panels are fully extended at 70 degrees, showing complex sawtooth trailing edges. Visible heavy-duty hydraulic actuators made of polished 300M steel. The wing skin is a mix of riveted Al-Li 2195 and matte gray RAM coating. Intense air turbulence and dust particles visible behind the spoilers. 4x TP400 engines in the background with propellers in reverse pitch. 8k, hyper-detailed engineering render.

Prompt: Technical 3D x-ray overlay of the SST T-130 Bizon fuselage. Highlighted in neon blue are the new titanium structural reinforcements connecting the wing-box to the main frames. Red pulse lines indicating the fiber-optic Structural Health Monitoring (SHM) network. Detailed view of the shear panels between the ribs in the cargo bay. High-contrast engineering aesthetic, blueprint background, 8k, photorealistic metal textures.

Prompt: Close-up technical shot of the SST T-130 Bizon wing showing two of the four Europrop TP400-D6 engines. Massive 8-blade scimitar propellers made of dark composite with silver leading edges. Heavy-duty titanium pylons integrated into the carbon fiber wing skin. Visible heat distortion (shimmer) from the exhaust. Engineering detail: hydraulic lines, sensors, and rivets. Photorealistic, 8k, cinematic lighting, dramatic angle from below.

Prompt: Technical rear view of the SST T-130 Bizon empennage. Massive V-tail configuration made of dark matte carbon fiber with exposed titanium joints. High-detail view of the ruddervators and their heavy-duty hydraulic actuators. The tail section is integrated into the wide fuselage made of Al-Li 2195. Visible sensors on the tips. Dramatic low-angle perspective, sunset lighting reflecting on the metallic surfaces, 8k, aerospace engineering render.

Prompt: Interior of the SST T-130 Bizon titanium cockpit capsule. Futuristic glass cockpit with 5 large panoramic touchscreens showing green tactical maps and engine data. 3 Martin-Baker ejection seats. Visible raw titanium ribs and carbon fiber panels. Pilots wearing high-tech HMD helmets. Outside the spinel windows, the 4 massive TP400 engines are visible. Cinematic lighting, hyper-realistic, 8k, Unreal Engine 5 style.

Prompt: Interior view of the massive SST T-130 Bizon cargo bay, 14.5 meters long. Wide 4.1m floor made of Vascomax 350 steel with industrial diamond-plate texture. Glowing green LED tactical lighting. A heavy armored vehicle is secured in the center. Visible titanium ribs of the fuselage and the open "Angelika 2" rear ramp in the background. High-tech, clean, industrial aesthetic, 8k, photorealistic engineering detail.

Prompt: Extreme close-up of the SST T-130 Bizon 12-wheel main landing gear. Massive 300M steel struts with hydraulic lines and sensors. The wheels are half-buried in soft mud, showing the heavy-duty tread pattern. The side sponson made of Al-Li 2195 is visible above. Realistic dirt, grease, and mechanical wear. Engineering masterpiece, 8k, macro photography style, dramatic industrial lighting.

Prompt: Interior of the SST T-130 Bizon cockpit at night during a forest landing. Close-up on the HMD visor of the pilot, showing a glowing green wireframe grid of trees and a highlighted landing path. The 5 glass displays show complex lidar point-clouds. Outside the windows, total darkness and fog, but the screens show a clear synthetic 3D environment. Glowing fiber-optic lines visible in the side panels. Hyper-realistic, futuristic, 8k, neon accents.

Prompt: Low-angle view of the SST T-130 Bizon rear ramp "Angelika 2" deployed on a muddy field. A 30-ton armored vehicle is halfway up the ramp. Visible titanium hydraulic actuators and the central Tri-Post support leg digging into the ground. The Vascomax 350 steel surface shows heavy tread marks and mud. Intense white LED floodlights from the cargo bay illuminate the scene. Hyper-realistic, 8k, industrial engineering detail.

Prompt: Thermal imaging (FLIR) style render of the SST T-130 Bizon. The image shows heat distribution: hot orange on the engine cores, but deep blue and purple on the wings and fuselage skin due to the liquid-cooling panels. Visible cold air mixing nozzles at the back of the 4 engine nacelles. Detailed view of the heat-radiating grills on the upper fuselage. High-tech military aesthetic, 8k, scientific visualization style.

Prompt: Engineering schematic of the SST T-130 Bizon side profile. Superimposed digital grid showing the Center of Gravity (CoG) symbol as a glowing yellow icon. Arrows indicating the force vectors from the 4 engines and the 30-ton internal load. The Tri-Post support is deployed at the rear. Technical UI overlay with balance percentages and weight distribution graphs. High-tech, blueprint aesthetic, 8k.

Prompt: Technical X-ray diagram of the SST T-130 Bizon wings and fuselage highlighting the fuel system. Glowing orange fluid paths showing the transfer between wing tanks and the nose trim tank. Visible fiber-optic sensors monitoring fuel levels. The 4 engines are connected by a complex web of blue-tinted titanium fuel lines. Engineering HUD overlay with flow rates and center of gravity markers. 8k, futuristic technical aesthetic.

Prompt: Internal cutaway of the SST T-130 Bizon showing the Environmental Control System (ECS). Glowing blue air-flow lines circulating through the titanium cockpit capsule and the 14-meter cargo bay. Visible Air Cycle Machines in the landing gear sponsons. The cargo bay floor

shows integrated ventilation grilles in the Vascomax 350 steel. Technical UI showing oxygen levels and pressure gradients. 8k, photorealistic, cold atmospheric lighting.

Prompt: Tactical action shot of the SST T-130 Bizon flying low over a forest. Massive clouds of magnesium flares and silver chaff are being ejected from the side sponsons in a "angel wing" pattern. No lasers visible. The 4 TP400 engines show darkened, shielded exhaust nozzles. Dark matte tactical camouflage. 8k, realistic military photography style, motion blur, dramatic sunset lighting.

Prompt: Internal view of the SST T-130 Bizon cargo bay during assembly. Workers installing dark-gray Kevlar spall liner panels on the walls. The floor shows the heavy-duty Vascomax 350 steel structure with a visible middle layer of Dyneema. Technical detail showing the Titanium Grade 23 armored bulkhead separating the cockpit. Professional engineering photography, 8k, realistic textures, workshop lighting.

Prompt: Wide shot of the SST T-130 Bizon parked in a dense pine forest. The aircraft features a sophisticated digital pixel camouflage in shades of NATO green, earth brown, and charcoal black. The matte, non-reflective surface absorbs the forest shadows. 4 massive propellers are still. The sub-dued gray "ST-02" and Polish checkerboard are barely visible on the tail. Hyper-realistic, 8k, cinematic lighting, forest floor environment.

Prompt: Technical cutaway of the SST T-130 Bizon showing the fire suppression system. Glowing red sensors in the engine nacelles and along the 14-meter cargo bay ceiling. Transparent blue lines representing the high-pressure water mist piping. Visible automated fire bottles integrated into the titanium frames. A heavy vehicle in the cargo bay is surrounded by a faint, cooling mist. 8k, engineering visualization, clinical high-tech lighting.

Prompt: A high-speed motion shot of the SST T-130 Bizon climbing at a steep angle immediately after a forest takeoff. All 4 engines leaving faint contrails, 32 propeller blades visible in a blur. The dark digital camouflage blends with the landscape below. Tactical data overlay showing speed, altitude, and G-force. Hyper-realistic, cinematic 8k, Unreal Engine 5 render style.

Prompt: The completed SST T-130 ARGO ST-02 "Bizon" in full digital forest camouflage, exiting a high-tech assembly hangar at dawn. All 4 massive engines are running, creating dust clouds. The 12-wheel landing gear is rock-solid. A Polish flag decal is visible on the titanium nose capsule. Hyper-realistic, 8k, cinematic masterpiece, the ultimate transport aircraft.

Prompt: Cinematic shot of the SST T-130 Bizon landing on a remote, dusty desert strip in Iran at twilight. The rear "Angelika 2" ramp is opening while the plane is still taxiing. Two light armored vehicles are visible inside the 14.5m cargo bay, ready to deploy. Dust clouds swirled by 4 massive propellers. Tactical team in the foreground. High-contrast desert lighting, 8k, photorealistic action scene, Unreal Engine 5 style.